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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,253	02/10/2005	Takaaki Kishigami	MAT-8658US	4635
23122	7590	07/10/2007	EXAMINER	
RATNERPRESTIA			CHEN, SHELLEY	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/524,253

Applicant(s)

KISHIGAMI ET AL.

Examiner

Shelley Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 7-11, 13, 16, 17, 20 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☐ Claim(s) 7-11, 13, 16-17, and 20-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claim 1 rejected** under 35 U.S.C. 103(a) as being unpatentable over **Matsuoka et al.** (U.S. Patent Application Publication # 2002/0085653).

Regarding claim 1, Matsuoka discloses an adaptive antenna radio communication device comprising:

-an array antenna made up of a plurality of antenna elements receiving high frequency signals that are transmitted by a multi-carrier (figure 5:101; abstract; paragraphs 15, 38)

-a demultiplexer for demultiplexing (at least) one of the high frequency signals received by a respective one of the antenna elements to a plurality of sub-carrier signals (figure 5:105, paragraphs 18, 38)

-Nd divided band direction estimating units for estimating the direction-of-arrival of a radio wave by dividing the communication band being said multi-carrier transmitted into Nd bands and using ones of the plurality of sub-carrier signals belonging to the respective divided bands (figure 5:112, paragraphs 18, 39)

-a divided band array weight creating unit for creating a weight of a receive array having a directional beam in the direction of estimation by said divided band direction estimating unit for said respective divided bands (figure 5:112 and 106-108, paragraphs 18, 21, 39)

-a subcarrier directivity creating unit for creating for creating a directivity by multiplication-combining the receive array weight created in each divided band with the corresponding sub-carrier signal belonging to the divided band (figure 5:106-108, paragraphs 18, 40-41, 47)

-a demodulating unit for demodulating data (figure 5:102, paragraph 38)

Matsuoka's invention differs from the instant invention in that Matsuoka's demodulating unit is not placed at the output of said sub-carrier directivity creating unit; it is placed at the output of the receiving antenna. However, the demodulating unit can be placed anywhere after the receiving antennas without changing the operation of the rest of the circuit, because the demodulating step is independent from the other steps (it

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only extracts the data communicated, which has no effect on the operation of the adaptive antenna device). The remaining components of the adaptive antenna device can be designed to operate on the received signal in either the modulated or demodulated forms.

It would have been obvious to move Matsuoka's demodulator to the output of the sub-carrier directivity creating unit, so that the remaining components operate on the received signals in the modulated form. Because the placement of the demodulator has no other effect on the operation of the adaptive antenna device, placement at the output of the sub-carrier directivity creating unit would be an obvious design choice.

Allowable Subject Matter

4. **Claims 7-11, 13, 16-17, and 20-21** objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 7-11, 13, 16-17, and 20-21 are allowable subject matter because none of the prior art discloses an adaptive antenna radio communication device wherein said divided band direction estimating unit further has a path search unit for calculating a delay profile by calculating a cross-correlation between respective input sub-carrier signals using a known pilot signal embedded in the sub-carrier signal and detecting a plurality of path arrival timings from the delay profile.

Response to Arguments

5. Applicant's argument with respect to the U.S.C. 112 rejection of claim 21 has been fully considered and is persuasive. The U.S.C. 112 rejection of claim 21 has been withdrawn.

6. Applicant's arguments with respect to the U.S.C. 103 rejection of claim 1 have been fully considered but they are not persuasive.

The applicant argues that Matsuoka fails to disclose *sub-carrier signals belonging to the respective divided bands*.

However, Matsuoka does in fact disclose this limitation. Paragraph 18 teaches that "each sub-carrier group includes a plurality of the sub-carriers whose center frequencies are located in the vicinity of the center frequency of one of pilot sub-carrier". Paragraph 39 teaches that "the sub-carriers are grouped into sub-carrier groups. Each sub-carrier group includes a plurality of sub-carriers having center frequencies located within a certain frequency width within which the dispersion of the antenna directivity patterns is negligible". These sub-carrier groups correspond to the claimed divided bands. Thus Matsuoka teaches the claimed limitation of claim 1.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelley Chen whose telephone number is (571) 270-1330. The examiner can normally be reached Mondays through Thursdays and on alternate Fridays, between 10:00 AM and 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached at (571) 272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Shelley Chen,



Patent Examiner

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June 26, 2007



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